MIBA INDUSTRIAL BEARINGS

Laser Cladding for Plain Bearings

A modern coating process

Traditionally, plain bearing metals are applied to backing materials by casting, a process that is limited in terms of flexibility, bonding quality, and efficiency. In contrast, laser cladding (LMD) enables precise, low-heat application to both radial and axial surfaces, and even in multilayer configurations, reducing waste, minimizing post-processing, and enabling efficient repair of worn components.

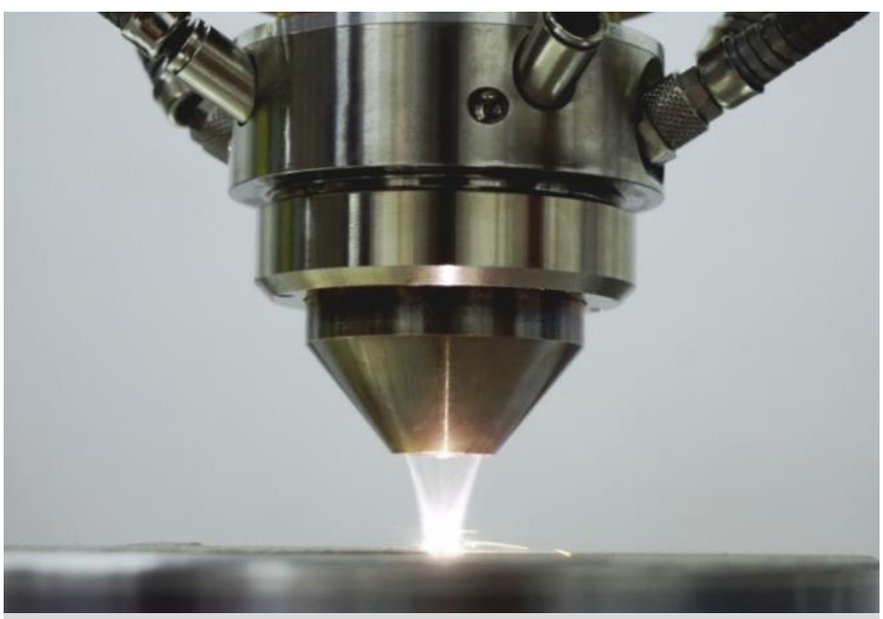

Figure 1: Laser cladding of white metal on steel substrate

Another major advantage of laser cladding is the ability to use materials that are not suitable for casting. This opens new possibilities for high-performance alloys such as the high-strength white metal Admiro56 (SnSb12Cu8.5), which was developed at ADMOS (Miba Industrial Bearings site in Berlin, Germany). Bronze alloys such as CuSn12Ni2 also provide strong, lead-free alternatives. Plain bearing materials that have already proven themselves in serial production with laser cladding can be summarized as follows:

- White metals: Tegostar (SnSb12Cu6ZnAg), B23 Grade2 (SnSb8Cu4)
- Bronze: CuSn12Ni2

Compared to casting, laser cladding achieves a superior metallurgical bond, significantly reducing the risk of delamination. Tests confirm higher bond strength in laser-cladded materials, with Admiro56 and CuSn12Ni2 delivering particularly excellent results:

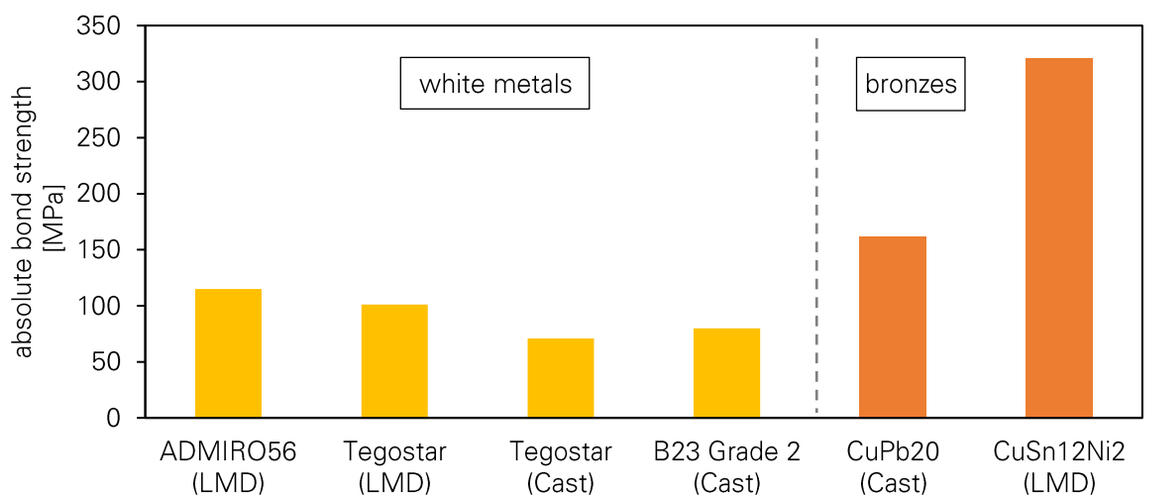

Figure 2: Absolute bond strength of casted and laser cladded (LMD) metals; extrapolated to a layer thickness

The ability to combine axial and radial coatings as well as multilayer structures (e.g. tin bronze combined with white metal) enables customized bearing solutions for demanding applications. With its strong metallurgical bond, lower preheating requirements, and a high degree of automation, laser cladding is not only a replacement for conventional casting, but a superior alternative. Applications range from thrust bearings in wind turbine gearboxes and hydropower turbines to marine propulsion and heavy machinery in steel mills to high-load compressors in the oil and gas industry. Its suitability for both new manufacturing and repair further increases its value for the bearing manufacturing.

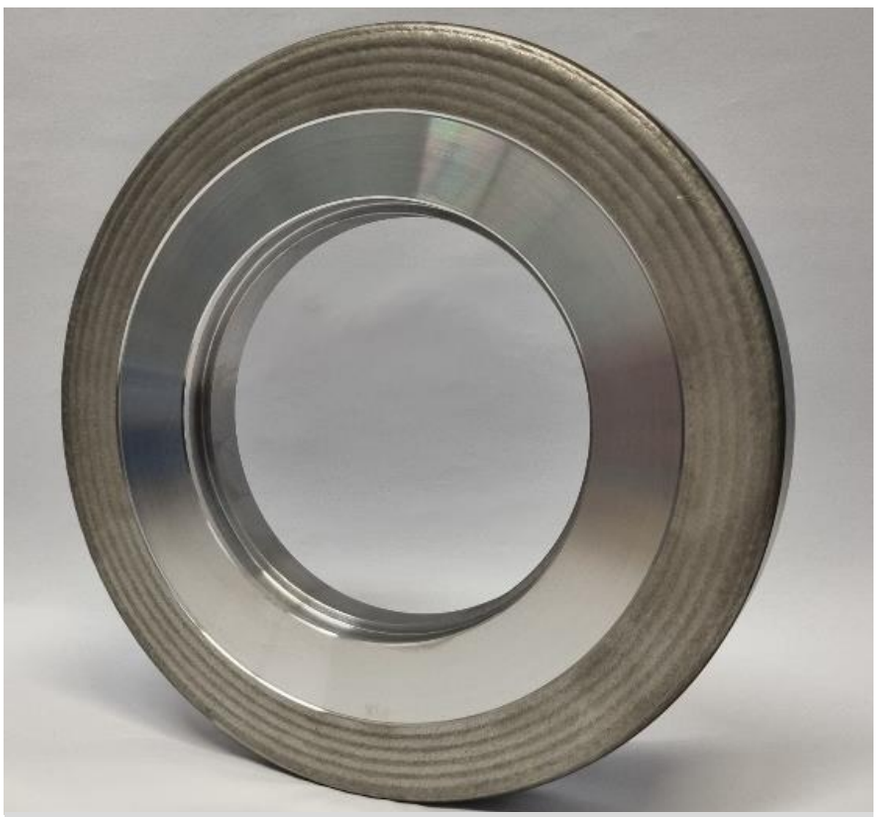

Figure 3: Axially coated white metal composite thrust ring

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